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Amendments to the Claims:

This listing of claims replaces all prior versions, and listings, of claims in the application.

Please add new claims 41 and 42.

Please amend claims 12 and 17 as indicated below. Material to be inserted is in **bold and underline**, and material to be deleted is in ~~strikeout~~ or (if the deletion is of five or fewer consecutive characters or would be difficult to see) in double brackets [[ ]].

Listing of Claims:

1. (Previously Presented) A device for sorting particles, comprising:

a channel structure defining a channel having an inlet and first and second outlets;

a first transport mechanism configured to create a particle stream of first particles and one or more second particles, each particle traveling along the channel from the inlet toward the first outlet and disposed in a fluid supported by the channel structure; and

a second transport mechanism configured to be pulse-activated to selectively move at least one of the second particles from the particle stream and toward the second outlet,

wherein the channel structure defines a passage disposed in fluid communication with the channel and generally opposing the second outlet, and wherein the passage

includes a fluid diode configured to restrict fluid backflow created by operation of the second transport mechanism.

2. (Original) The device of claim 1, wherein the channel structure includes a substrate and a plurality of thin-film electrical devices formed on the substrate, and wherein the second transport mechanism is included in the thin-film electrical devices.

3. (Original) The device of claim 2, wherein the channel structure includes a fluid barrier connected to the substrate so that the thin-film electrical devices are disposed between the substrate and the fluid barrier.

4. (Original) The device of claim 1, wherein the first transport mechanism is configured to create a flow of the fluid through the channel, and wherein the flow of the fluid creates the particle stream.

5. (Original) The device of claim 4, wherein the first transport mechanism is configured to produce a pressure drop along the channel.

6. (Original) The device of claim 1, wherein the channel structure is configured so that the particle stream follows a path from the inlet to the first outlet without operation of the second transport mechanism, and wherein the second transport mechanism is configured to exert pressure pulses directed transverse to the path.

7. (Original) The device of claim 6, wherein one of the pressure pulses is configured to move a fraction of the fluid from the path, the fraction including the at least one second particle.

8. (Original) The device of claim 1, wherein the second transport mechanism includes at least one of a heater element and a piezoelectric element.

9. (Original) The device of claim 1, wherein the channel is a first channel and the inlet is a first inlet, the channel structure defining a second channel adjacent to the first channel and configured to carry another fluid from a second inlet to a third outlet, and wherein the second outlet of the first channel places the first channel in fluid communication with the second channel.

10. (Canceled)

11. (Original) The device of claim 1, further comprising an optical sensor configured to sense the at least one second particle in the particle stream, the optical sensor being coupled to the second transport mechanism so that sensing the at least one second particle actuates the second transport mechanism.

12. (Currently Amended) A device for sorting particles, comprising:

a substrate assembly including a substrate, a plurality of thin-film electrical devices formed on the substrate, and a fluid barrier connected to the substrate such that the substrate assembly defines ~~a channel structure defining~~ a channel having an inlet and first and second outlets**, the channel and the thin-film electrical devices being disposed generally between the substrate and the fluid barrier**;

a first transport mechanism configured to move first particles and one or more second particles in the channel from the inlet toward the first outlet, the first particles and one or more second particles being disposed in a fluid; and

a second transport mechanism configured to apply a transient pressure pulse on the fluid so that at least one of the second particles is selectively moved toward the second outlet,

wherein the second transport mechanism includes a thin-film heater element, a thin-film piezoelectric element, or **both, and wherein the thin-film heater, the thin-film piezoelectric element, or both are included in the thin-film electrical devices**.

13. (Canceled)

14. (Original) The device of claim 12, wherein the first transport mechanism is configured to create a flow of the fluid through the channel, and wherein the flow of the fluid carries the first particles and one or more second particles.

15. (Original) The device of claim 14, wherein the second transport mechanism is configured to apply the transient pressure pulse to a segment of the fluid in which the at least one second particle is disposed.

16. (Original) The device of claim 12, wherein the channel structure is configured so that the first particles and one or more second particles follow a path from the inlet to the first outlet without operation of the second transport mechanism, and wherein the transient pressure pulse is directed transverse to the path.

17. (Currently Amended) A device for sorting particles, comprising:

a channel structure defining first and second channels that extend adjacent one another and between respective pairs of opposing ends of the first and second channels, the channel structure further defining a transverse channel that connects the first channel to the second channel intermediate the pair of opposing ends of each channel;

a first transport mechanism configured to send respective first and second streams through the first and second channels, the first stream including first particles and one or more second particles; and

a second transport mechanism configured to selectively move at least one of the second particles from the first stream **in the first channel** to the second stream **in the second channel** via the transverse channel.

18. (Original) The device of claim 17, wherein the channel structure includes a substrate and a plurality of thin-film electrical devices formed on the substrate.

19. (Original) The device of claim 17, wherein the first particles and the one or more second particles are different types of cells.

20. (Original) The device of claim 17, wherein the first stream follows a path, and wherein the second transport mechanism is configured to apply transient pressure pulses to the first stream and transverse to the path.

21-40. (Canceled)

41. (New) The device of claim 12, wherein the second transport mechanism includes a thin-film heater.

42. (New) The device of claim 17, wherein the transverse channel provides the same path between the first and second channels whether or not the second transport mechanism is selectively moving a second particle.